

winds along the North Carolina coast had shifted to north and east and increased to gales, with very heavy rains. In about lat. 30° N., long. $79^{\circ} 30'$ W., several vessels encountered heavy SSW. gales, which veered to NNW. and increased to hurricane force; 30° N., 70° W., very heavy westerly gales on this and following days, heavy seas stove deck-houses, sails blown away, &c.; $32^{\circ} 30'$ N., $77^{\circ} 15'$ W., heavy SW. gale veered to NW., heavy sea; 34° N., $75^{\circ} 40'$ W., hurricane from NNE. veered to NW. for fifteen hours; off Cape Hatteras severe NE. gale for thirty hours; $36^{\circ} 10'$ N., $72^{\circ} 10'$ W., strong SE. gale for twelve hours, suddenly changed to NNE., blew with hurricane violence, continued for thirty hours, and backed to NW., barometer 28.30, bad cross-seas, decks swept, struck by lightning; off Hatteras, SE. gale, veered to S. and SW., suddenly shifted to WNW. and increased to a hurricane, with heavy cross-sea; $33^{\circ} 45'$ N., $77^{\circ} 10'$ W., most violent gale ever experienced; at Bermuda squally weather commenced in the evening. Maximum velocities: SW. 36 at Punta Rassa; NW. 32 at St. Marks and Atlanta; NW. 39 at Savannah; NW. 36 at Wilmington; N. 52 at Cape Lookout, and NE. 61 at Kittyhawk. 31st, its path was evidently farther to the eastward than as traced on the chart; at Bermuda, by noon, barometer fell to about 29.30, with heavy wind, thunder-storm and hail; $36^{\circ} 30'$ N., 73° W., heavy E. gale, veered to NW., increased to hurricane; 200 miles east by south from Sandy Hook, heavy S. gale, veered to NE. for two days with heavy cross-sea, barometer 28.37 in.; along the coast from North Carolina to Maine terrific NE. gales prevailed and gradually backed to NW., with snow, partly turning into rain, on the New England coast; shipping suffered very heavily, numerous vessels having been damaged, while reports have been received of the total loss of a number. Maximum velocities: N. 65 miles at Kittyhawk; N. 78 at Cape Henry; NW. 60 at Cape May; NW. 48 at Philadelphia; NW. 56 at Sandy Hook; NW. 30 at New London; NW. 48 at Wood's Holl; NW. 33 at Boston; N. 36 at Portland, and NE. 36 at Eastport. In the afternoon isobar 29.30 included an immense area—the greater portions of Nova Scotia and New England, the New Jersey coast, and thence to Bermuda. By midnight the barometer at Portland had fallen to 28.92, or 1.02 below normal; at Eastport, to 28.83, or 1.07 below normal, with heavy thunder-storm; at Halifax, to 28.95, with heavy rain and southeast wind. During the following day the centre passed over Nova Scotia to the Gulf of St. Lawrence; the p. m. barometer at Halifax fell extraordinarily low, 28.50, or 1.33 below the normal. For several days later incoming vessels report having experienced gales and high sea to the eastward of Nova Scotia. This was the most severe and destructive storm of the month. Cautionary Signals were kept up the 30th along the New England coast and ordered for the North Carolina coast; also, Off-Shore Signals for the New Jersey coast. On the 31st all Signals were changed to Off-Shore. Warnings were continued for the Canadian stations in Nova Scotia and New Brunswick. All were well justified by the subsequent gales.

No. XVII.—During the night of the 29th the pressure fell below the normal in California and Oregon. 30th, it continued diminishing, with increasing cloudiness, and extending eastward toward the Rocky Mountains. 31st, a. m. barometer at San Francisco 0.32 below normal; the central depression moved northward toward Oregon; frequent light rains fell in California.

No. XVIII.—probably passed southeastward over the Northwest on the 30th as a slight barometric depression. 31st, it developed into a storm-area over the Southwest, with frequent light rains thence to Tennessee, the Ohio valley, Upper Lake region, Northwest, Wyoming, Colorado and New Mexico. Brisk to high southerly winds prevailed in the Southwest; and high northerly winds or gales in the Northwest, where the barometric gradient became quite steep through the rapid advance of high pressure No. X. The wind velocity reached S. 32 miles at Indianola; NE. 48 at Dodge City; NE. 32 at North Platte; N. 31 at Yankton; NW. 35 at Breckenridge, and NW. 42 at Pembina. The midnight barometer at Shreveport fell to 0.42 below the normal.

INTERNATIONAL METEOROLOGY.

On chart No. IV are shown the probable tracks of storm-centres over the oceans, deduced from data received at this office up to April 5th; and in the upper right hand corner will be found an index to the same. In the upper left hand corner is a small table giving the approximate wind direction and probable maximum velocities (in miles per hour and metres per second) attending the depressions on the dates named. The following is a brief notice of the same, and also of some storms over the Southern Hemisphere.

Atlantic Ocean.—No. I is a continuation of area No. III of the February REVIEW; it passed rapidly eastward, south of Newfoundland, on the 10th of February. On the 11th it was encountered by the steamships "Ohio" and "Hibernian," and on this day and the 12th it prevailed as a violent storm between the meridians 50° and 25° W. On the 13th and 14th it moved southeast off the Irish coast, and high pressures, with fresh to strong westerly gales, prevailed over mid-ocean; on the latter day, and until the 18th, it was accompanied by severe gales and hurricane-winds from the Bay of Biscay to the Baltic. No. II is a continuation of area No. IV of the same REVIEW. It passed northeastward to the north of Newfoundland on February 13th. From the time of the passage eastward of the preceding area to the 19th, the pressure remained quite low over the British Isles, with the centre of depression apparently to the west-northwest, and it is possible that the present area moved somewhat as shown on chart; on the 20th it was over the British Isles, and on the 22nd approached the Baltic. No. III is a continuation of No. VI of the same REVIEW. During February 21st and 22nd it moved slowly as a very severe storm, as shown on the chart; on the 22nd it passed northward over Newfoundland, and severe southerly gales were experienced as far east as 37° W. From the 24th to the 26th it probably moved eastward, and passed to the north of Scotland on the 27th. No. IV developed in the southwest quadrant of area No. II on the 23rd. No. V developed

further southward, over Algeria, on the 24th. As the two latter storms moved northward, they were accompanied by very severe and destructive gales over the whole of western Europe. *South Atlantic and Indian Oceans*.—The following reports probably refer to the same storm, the centre of which evidently moved eastward at a short distance to the south of the positions on the dates named; *September 28th, 1878*, lat. 37° 41' S., long. 0° 13' W., terrific cyclone; 30th, 40° 30' S., 25° 20' E., hurricane from NNW., veering to W. and SW., lasting 20 hours; *Oct. 5th*, 38° 11' S., 59° E., hurricane from NE., NNW. and SSW., lasting three days. *Pacific Ocean*.—Storms moved in the directions indicated by the tracks Nos. I, II, III and IV on the dates named, but reports are too meagre to determine the positions of their centres with any degree approaching accuracy. No. IV was accompanied by a northerly gale and heavy rain on *Feb. 23rd*, at Yokohama; barometer at 11:30 a. m., 28.97 inches. *South Pacific Ocean*.—*May 6th and 7th, 1878*, severe hurricane passed over Paumotu Islands, (17° S., 143° W.) "by which 150 lives were lost, and \$250,000 worth of property destroyed." *December, 9th, 1878*, 3° 52' S., 167° 31' W., bar. 29.77, E. gale; 13th, 22° 17' S., 174° 36' W., bar. 29.85, E. to N. gale, squally, heavy rain; 27th and 28th, Sydney harbor, New South Wales, bar. 29.56 to 29.83, cloudy and rainy weather, followed by SSE. squalls. *January 30th, 1879*, 33° 53' S., 152° 16' E., bar. 29.73, N. Gale. *Southern Ocean*.—*May 4th, 1878*, 47° S., 110° E., 10 p. m., barometer fell to 28.76, with terrific NNW. gale and tremendous sea. *May 12th to 18th, 1878*, very heavy W. gale off south coast of New Zealand, the barometer falling to 28.40 on the 17th. *Indian Ocean*.—*December 12th, 1878*, 12° 55' S., 99° 45' E., "cyclone," wind veering from ESE. to S. and SW., lasting 24 hours. Ship "Lady Palmerston," from Calcutta, Nov. 29th, and Sand Heads, Dec. 1st, 1878, experienced a "cyclone" in the Indian Ocean lasting seven days, and rounded Cape of Good Hope *January 25th, 1879*. *January 24th, 1879*, a "cyclone," traveling southward, was probably central about 23° S., 67° E., at midnight of the above date; it was encountered by ships "John R. Worcester" and "Paul Jones." *February 26th, 1879*, "a cyclone" passed southward east of Mauritius during the morning; at this place the wind backed from ESE. to WSW. and attained a mean hourly velocity of 63 miles from 10.30 to 11.30 a. m.; the barometer, which had been slowly falling from the 22nd to the 25th, fell very rapidly on the morning of the 26th, and reached its minimum, 29.183, (corrected and reduced,) at 11.40 a. m.; rainfall, 2.54 inches. "Lloyd's agent at Freemantle, western Australia, reports that three vessels were wrecked during hurricane (no date) at Lacepedes, vessels total loss, crews saved." *Cerro de Pasco, Peru*.—Dr. Geo. A. Ward, in forwarding meteorological reports from Pasco, gives the altitude of station as 14,400 feet above sea-level; he states that the storms of that neighborhood are exceedingly local in their effects, usually being of short duration and accompanied by much electricity. Earthquakes occasionally occur, and those reported will be found under the special heading near the end of this REVIEW. A "frosty fog" often occurs, which is considered to be productive of pulmonary diseases. The observations consist of temperatures, (taken at irregular hours,) and various meteorological notes for the months of May, June, August, September, October, November and December, 1878. The following table gives the highest and lowest temperatures and number of days on which rain or snow and frosts were observed each month:

DATE.	TEMPERATURES.				No. OF DAYS.	
	Hour.	Max.	Hour.	Min.	Rain or snow.	Frosts.
1878—May.....	4 p. m...	60°	7 a. m...	26°	5	7
June.....	4:15 p. m...	44°	6 a. m...	26°	7	8
August.....	9 a. m...	66°	6:40 a. m...	27°	5	7
September.....	1:15 p. m...	56°	6:20 a. m...	36°	9	3
October.....	12:30 p. m...	58°	6:05 a. m...	34°	15	5
November.....	11:15 a. m...	57°	7 a. m...	32°	21	3
December.....	3:50 p. m...	57°	6 a. m...	32°	19	7

TEMPERATURE OF THE AIR.

The isothermal lines upon chart No. II show the general distribution of the temperature of the air for the month. By a reference to the table of average temperatures upon the same chart it will be seen that the temperature for the present month averages above that for several years in all the districts, especially throughout the elevated country between the Mississippi valley and the Sierra Nevada Mts.; Salt Lake City and Pike's Peak, unusually high.

Minimum and Maximum Temperatures, respectively, are for *Maine*—at Portland, 10° and 55°; Gardiner, —7°, 45°; Eastport, 4°, 44°. *New Hampshire*—Mt. Washington, —10°, 35°; Dunbarton, —5°, 55°. *Vermont*—Burlington, 0°, 50°; Woodstock, —10°, 55°. *Massachusetts*—Westborough, 10°, 62°; Williamstown, 3°, 51°; Boston, 8°, 61°. *Rhode Island*—Newport, 16°, 55°. *Connecticut*—Mystic, 12°, 62°; New London, 15°, 55°. *New York*—Plattsburg Bks., —6°, 44°; Starkey, —2°, 72°; Buffalo, 13°, 64°; New York city, 29°, 72°; Schroon Lake, —12°, 52°; Nile, 0°, 60°. *New Jersey*—Princeton, 13°, 65°; Atco, 22°, 71°.